Status of the Claims

The listing of claims will replace all prior versions, and listings of claims in the application.

1. *(previously presented)* A method for receiving an optical data signal, comprising:

(1) receiving an optical data signal;

(2) converting the optical data signal to an electrical signal having a symbol rate;

(3) generating N sampling signals having a first frequency that is lower than the symbol rate, the N sampling signals shifted in phase relative to one another, wherein N is an integer greater than one;

(4) controlling N analog-to-digital converter ("ADC") paths with the N sampling signals to sample the electrical signal at the phases, to produce samples;

(5) performing at least one M-path parallel digital process on the samples, wherein M is greater than N; and

(6) generating a digital signal representation of the optical data signal from the samples.

2. *(previously presented)* The method according to claim 1, wherein step (5) further comprises performing an equalization process on the samples.

3. *(previously presented)* The method according to claim 2, wherein step (5) further comprises performing a Viterbi equalization process on the samples.

4. *(previously presented)* The method according to claim 2, wherein step (5) further comprises performing a feed-forward equalization process on the samples.

5. *(previously presented)* The method according to claim 2, wherein step (5) further comprises performing a decision feedback equalization process on the samples.

6. *(previously presented)* The method according to claim 2, wherein step (5) further comprises performing Viterbi equalization and feed-forward equalization processes on the samples.

7. *(previously presented)* The method according to claim 2, wherein step (5) further comprises performing Viterbi equalization and decision feedback equalization processes on the samples.

8. *(previously presented)* The method according to claim 2, wherein step (5) further comprises:

performing one or more of the following types of equalization processes on the samples:

Viterbi equalization;

feed-forward equalization; and

decision feedback equalization.

9. *(previously presented)* An optical receiver, comprising:

a receiver input;

an optical-to-electrical converter coupled to the receiver input;

an analog-to-digital converter ("ADC") array of N ADC paths, wherein N is an integer greater than 1, each ADC path including an ADC path input coupled to an output of the optical-to-electrical converter; and

an M-path digital signal processor coupled to the ADC array, wherein M is greater than N.

10. *(previously presented)* The optical receiver according to claim 9, wherein the digital signal processor includes an equalizer.

11. *(previously presented)* The optical receiver according to claim 10, wherein the equalizer comprises a Viterbi equalizer.

12. *(previously presented)* The optical receiver according to claim 10, wherein the equalizer comprises a feed-forward equalizer.

13. *(previously presented)* The optical receiver according to claim 10, wherein the equalizer comprises a decision feedback equalizer.

14. *(previously presented)* The optical receiver according to claim 10, wherein the equalizer comprises a Viterbi equalizer and a feed-forward equalizer.

15. *(previously presented)* The optical receiver according to claim 10, wherein the equalizer comprises a Viterbi equalizer and a decision feedback equalizer.

16. *(previously presented)* The optical receiver according to claim 10, wherein the equalizer comprises a feed-forward equalizer and a decision feedback equalizer.

17. *(previously presented)* The optical receiver according to claim 10 wherein the equalizer comprises one or more of:

a Viterbi equalizer;

a feed-forward equalizer; and

a decision feedback equalizer.

18. *(previously presented)* An optical receiver, comprising:

means for receiving an optical data signal;

means for converting the optical data signal to an electrical signal having a symbol rate;

means for generating N sampling signals having a first frequency that is lower than the symbol rate, the N sampling signals shifted in phase relative to one another;

means for controlling N analog-to-digital converter ("ADC") paths with the N sampling signals to sample the electrical signal at the phases to produce samples;

means for performing at least one M-path parallel digital process on the samples, wherein M is greater than N; and

means for generating a digital signal representation of the optical data signal from the samples.

19. *(previously presented)* The system according to claim 18, wherein the means for performing digital processes on the samples include means for equalizing the samples.

20. *(previously presented)* The system according to claim 19, wherein the means for equalizing the samples comprise means for performing a Viterbi equalization process on the samples.

21. *(previously presented)* The system according to claim 19, wherein the means for equalizing the samples comprise means for performing a feed-forward equalization process on the samples.

22. *(previously presented)* The system according to claim 19, wherein the means for equalizing the samples comprise means for performing a decision feedback equalization process on the samples.

23. *(previously presented)* The system according to claim 19, wherein the means for equalizing the samples comprise means for performing Viterbi equalization and feed-forward equalization processes on the samples.

24. *(previously presented)* The system according to claim 19, wherein the means for equalizing the samples comprises means for performing Viterbi equalization and decision feedback equalization processes on the samples.

25. *(previously presented)* The method according to claim 2, wherein step (1) comprises receiving the optical data signal from a multimode optical fiber and step (5) comprises equalizing multimode dispersion from the multimode optical fiber.

26. *(previously presented)* The method according to claim 2, wherein step (1) comprises receiving the optical data signal from a single mode optical fiber and step (5) comprises equalizing chromatic and/or waveguide dispersion from the single mode optical fiber.

27. *(previously presented)* The method according to claim 2, wherein step (1) comprises receiving the optical data signal from a multimode optical fiber and step (5) comprises equalizing chromatic and/or waveguide dispersion from the multimode optical fiber.

28. *(previously presented)* The method according to claim 2, wherein step (1) comprises receiving the optical data signal from a single mode optical fiber and step (5) comprises equalizing polarization mode dispersion from the single mode optical fiber.

29. *(previously presented)* The method according to claim 2, wherein step (1) comprises receiving the optical data signal from a single mode optical fiber and step (5) comprises equalizing dispersion induced in the single mode optical fiber by laser chirping.

30. *(previously presented)* The method according to claim 2, wherein step (1) comprises receiving the optical data signal from a transmitter that lacks external modulators, and step (5) comprises equalizing excess dispersion induced by laser chirping.

31. *(previously presented)* The optical receiver according to claim 10, wherein the input is coupled to a multimode optical fiber and the equalizer equalizes multimode dispersion from the multimode optical fiber.

32. *(previously presented)* The optical receiver according to claim 10, wherein the input is coupled to a single mode optical fiber and the equalizer equalizes chromatic and/or waveguide dispersion from the single mode optical fiber.

33. *(previously presented)* The optical receiver according to claim 10, wherein the input is coupled to a multimode optical fiber and the equalizer equalizes chromatic and/or waveguide dispersion in the multimode optical fiber.

34. *(previously presented)* The optical receiver according to claim 10, wherein the input is coupled to a multimode optical fiber and the equalizer equalizes polarization mode dispersion from the single mode optical fiber.

35. *(previously presented)* The optical receiver according to claim 10, wherein the input is coupled to a single mode optical fiber and the equalizer equalizes dispersion induced in the single mode optical fiber by laser chirping.

36. *(previously presented)* The optical receiver according to claim 10, wherein the input receives the optical data signal from a transmitter that lacks external modulators, and the equalizer equalizes excess dispersion induced by laser chirping.

37. *(previously presented)* The optical receiver according to claim 19, wherein the means for receiving an optical signal is coupled to a multimode optical fiber and the means for equalizing comprises means for equalizing multimode dispersion from the multimode optical fiber.

38. *(previously presented)* The optical receiver according to claim 19, wherein the means for receiving an optical signal is coupled to a single mode optical fiber and the means for equalizing comprises means for equalizing chromatic and/or waveguide dispersion from the single mode optical fiber.

39. *(previously presented)* The optical receiver according to claim 19, wherein the means for receiving an optical signal is coupled to a multimode optical fiber and the means for equalizing comprises means for equalizing chromatic and/or waveguide dispersion in the multimode optical fiber.

40. *(previously presented)* The optical receiver according to claim 19, wherein the means for receiving an optical signal is coupled to a multimode optical fiber and the means for equalizing comprises means for equalizing polarization mode dispersion from the single mode optical fiber.

41. *(previously presented)* The optical receiver according to claim 19, wherein the means for receiving an optical signal is coupled to a single mode optical fiber and the means for equalizing comprises means for equalizing dispersion induced in the single mode optical fiber by laser chirping.

42. *(previously presented)* The optical receiver according to claim 19, wherein the means for receiving an optical signal receives the optical data signal from a transmitter that lacks external modulators, and the means for equalizing comprises means for equalizing excess dispersion induced by laser chirping.

43. *(previously presented)* The method according to claim 1, wherein step (5) comprises decoding a convolutional code.

44. *(previously presented)* The method according to claim 1, wherein step (5) comprises decoding a trellis code.

45. *(previously presented)* The method according to claim 1, wherein step (5) comprises decoding a block code.

46. *(previously presented)* The optical receiver according to claim 9, wherein the digital signal processor comprises a convolutional decoder.

47. *(previously presented)* The optical receiver according to claim 9, wherein the digital signal processor comprises a trellis decoder.

48. *(previously presented)* The optical receiver according to claim 9, wherein the digital signal processor comprises a block decoder.

49. *(previously presented)* The optical receiver according to claim 18, wherein the means for performing digital processes on the samples comprises means for decoding a convolutional code.

50. *(previously presented)* The optical receiver according to claim 18, wherein the means for performing digital processes on the samples comprises means for decoding a trellis code.

51. *(previously presented)* The optical receiver according to claim 18, wherein the means for digitally performing digital processes on the samples comprises means for decoding a block code.

52. (*previously presented*) The method according to claim 1, wherein M equals 2N.

53. (*cancelled*)

54. (*previously presented*) The optical receiver according to claim 9, wherein M equals 2N.

55. (*cancelled*)

56. (*previously presented*) The system according to claim 18, wherein M equals 2N.

57. (*cancelled*)